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Master's Paper

UNIT ORGANIZATION OF TWO TOPICS IN OCCUPATIONS

Service Paper

Submitted by

Winifred Margaret Burns

(B.S. in Ed., Salem Teachers College, 1942)

In partial fulfillment of requirements for the degree of Master of Education

1947

First Reader: Roy O. Billett, Professor of Education

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CHAPTER I

THE SCOPE OF THE STUDY

Statement of the Problem

The problem.-- The problem for this study is the organization of two units of work in occupations to be used in an eighth grade. The purpose of the first unit is to give an introduction to the study of occupations, and the second deals with a survey of occupations in the professional and semi-professional fields.

A change from homogeneous to heterogeneous grouping in the local situation made the need of such an organization of subject matter felt keenly.

Unit method as used in the study defined.-- All teaching is by some kind of unit, and the decision as to which type to use must be made by the teacher. The unit method to be used in the work planned here is defined as "a systematic way of taking into consideration and applying with due emphasis every basic educational principle which should function in every good teaching-learning cycle". 1/

1/ From a course entitled "The Unit Method in the Secondary School" given at Boston University School of Education by Prof. Roy O. Billett.

Reasons for selecting this method.-- The writer's reasons for selecting the method to be used are as follows:

1. The teacher can adjust the unit to the individual pupil's present level of educative growth. Activities of varying degrees of difficulty may be set up in the unit assignment so that those who need to do work on a lower level than others may start at their present level of ability and progress from that point, while more capable pupils have an opportunity to work on a more advanced level. Thus, the method provides for individual differences and is a method of educating a heterogeneous group.

2. It contributes to an effective use of discussions, readings, reports, demonstrations, visual and auditory aids, library work, and projects.

3. It permits the integration of the course with other courses taken by the pupils. Also, extra curricular and out-of-school activities can be made to contribute to the pupil's in-school education.

4. It can be made the basis of a gradual process of improvement. Through frequent revisions the course may be brought to higher and higher levels.

Study of Class for Which Units Were Made

Extent to which class was studied.-- The units which follow are intended for a group of 161 eighth-grade pupils divided heterogeneously into five sections of approximately equal size. Before building the units a study was made of the backgrounds, chronological ages, intelligence quotients, abilities, and out-of-school activities of the students who constituted the enrollment in grade eight in September, 1946.

The community and the school.-- The community is a town which has a population of approximately 12,000. It is largely a residential section, there being no large industry carried on. Nearly all of the inhabitants are American born.

Pupils enrolled in the schools of the town number about 1,958, and of this number 879 attend a combination junior-senior high school in the eighth grade of which these units were used.

Occupational status of parents.-- A survey of the occupational status of the parents of the 161 students shows that the range of occupations is very wide. However, most parents work on a skilled or professional level. Such a study indicates to the teacher the type of occupational information which the pupils will understand.

Table 1. Distribution of 161 Students According to Chronological Age

Age	Number of Students
11 to 11-11	1
12 to 12-11	42
13 to 13-11	96
14 to 14-11	16
15 to 15-11	6
Total	161

The ages in the group range from 11 years and 7 months to 15 years and 10 months. The median age is 13 years and two months.

Meeting the needs of pupils of varying ages had to be dealt with in planning the units since boys and girls of twelve years of age have quite different interests from those of fifteen years of age and over. The unit assignment can make provision for such varied interests.

Reading ability.-- In reading ability the group as a whole rates high. In April, 1945, 150 of the group under consideration took the Stanford Achievement Test (Intermediate Battery-Complete). Results showed that 114 were above grade in average reading ability. The poorest reader was retarted 2 years and 8 months, while the best reader was 4 years and 5 months in advance of his grade level at the time of the test. Such a wide range in reading abilities must be taken into consideration in building the units.

Intelligence quotients. -- Between December 12 and December 17, 1945, all pupils concerned in this study were given Form R of the Otis Classification Test (revised) which is a combination of a mental Ability Test (Part I) and an Achievement Test (Part II). The distribution of intelligence quotients obtained on Part I of the above mentioned test is given in Table 2.

Table 2. Distribution of Intelligence Quotients as Obtained on the Otis Classification Test

I. Q's	Number of Pupils
140 to 149	1
130 to 139	3
120 to 129	25
110 to 119	58
100 to 109	39
90 to 99	28
80 to 89	5
70 to 79	2
Total	161

The range of I. Q's in the group is from 76 to 141, and the median is found to be 111. Therefore, activities to challenge the brightest as well as those which are not too difficult for the slowest must be included in the unit assignment.

Table 3. Grade Status as Determined by the Otis Classification Test

Grade Level	Number of Pupils	Grade Level	Number of Pupils
9.9+	48	7.5	2
9.9	1	7.4	2
9.8	0	7.3	1
9.7	4	7.2	2
9.6	0	7.1	1
9.5	3	7.0	0
9.4	0	6.9	7
9.3	2	6.8	0
9.2	6	6.7	3
9.1	4	6.6	2
9.0	6	6.5	0
8.9	5	6.4	1
8.8	2	6.3	2
8.7	4	6.2	1
8.6	5	6.1	1
8.5	3	6.0	0
8.4	4	5.9	2
8.3	7	5.8	1
8.2	6	5.7	2
8.1	3	5.6	0
8.0	5	5.5	1
7.9	0	5.4	0
7.8	2	5.3	1
7.7	3	5.2	0
7.6	5	5.1	1
		Total	161

At the time that the test referred to in Table 3 was given the grade norm was 7.4. The median grade level for the group was 8.8. The study of grade status shows that 130 of these eighth grade pupils were above their grade norm as determined by the Otis Classification Test.

Table 4. Out-of-School Activities Listed by Pupils

Activities	Number of Pupils
Movies, Radio, Reading.....	All
Dancing lessons.....	87
Music lessons	57
Girl Scouts	49
Boy Scouts	41
Y.M.C.A. members	12
Neighborhood Club	6
Good Sport Club	3
Audubon Society	1
Skating Club	1
Lessons in tin work	1
Airplane Club	1
Dramatic lessons	1
Camp Fire Girls	1
Handy Work Club	1
Baton lessons	1
Stamp Club	1
Chemistry Club	1
Good Time Club	1

A study of the abilities and interests of a group is an aid to the selection of functional subject matter, and some of the above personal data will make possible the adaptation of the work to individual interests.

One authority on the study of occupations has this to say about out-of-school activities:[1/]

> Outside of school groups such as scouts.... have opportunities for acquiring information on vocations, and to some extent try-out through activities often quite similar to vocational tasks.
>
> All activities that have to do with discovering abilities and gaining experiences and information along vocational lines should be considered complementary to the study of vocations.

1/ Mildred Lincoln Billings, Group Methods of Studying Occupations, International Textbook Co., Scranton, Penn., 1941, p.248.

Space Provisions and Equipment

The classroom.-- The classroom in which the units were taught is small (28 feet long and 22 feet wide), and accommodates 36 pupils. In one class section every seat was occupied while in others there were fewer pupils. This space limitation is a serious handicap for even though the desks and chairs are movable, there can be comparatively little freedom of action in an ordinary class period because too many would have to be disturbed to enable one small group to function separately. Obviously this is a situation over which the classroom teacher has no control.

Books and magazines.-- Forty copies of each of the following books are in the bookcase:

Brewer, John M. and Edward Landy, Occupations Today, Ginn and Company, Boston, 1943.

Smith, Charles M. and Samuel Baron, Choosing Your Course, Henry Holt and Company, New York, 1942.

Davey, Mildred A., Elizabeth M. Smith, and Theodore R. Myers, Everyday Occupations, D. C. Heath and Company Boston, 1941.

Aside from these textbooks the classroom library is very limited, there being about a dozen reference books which pupils may use. However, the school is most fortunate in having an exceedingly well equipped school

library and a most co-operative librarian. Arrangements can be made to select library materials and place them in the classroom for certain activities where the supervision and help of the teacher is desirable, and on other occasions groups of the pupils may be excused from the classroom to work in the library. This arrangement has been quite satisfactory.

A classroom subscription to the magazine Vocational Trends provides excellent supplementary material for the best readers in the various groups.

Pictures and clippings.-- A recently acquired filing cabinet has proved convenient for the storing and classifying of pictures and clippings.

Bulletin boards.-- Two sides of the room consist of blackboards. It is hoped that in time at least half of this space may be devoted to bulletin boards. As of now the only bulletin space available is a 36-inch square and an eight-inch border above the blackboards.

Smaller classes and more classroom equipment would enable the teacher to achieve greater flexibility, and this will be a goal toward which to work in the future.

The Teaching of the Units

Time allotment.-- The presentation of Unit I began on September 5, 1946, and the work continued for a period of eight weeks, two periods per week. Circumstances beyond the control of the teacher delayed the teaching of Unit II until January, 1947. The pretest on this unit was administered on January 5, and the activities connected with the unit assignment extended over another eight-week period.

Four phases of the teaching-learning cycle.-- The teaching-learning cycle in the unit method used consists of four phases. The first is introductory.[1/] Here, a study of the individual pupils having been made from the cumulative records, a one-hundred-point teacher-built objective test was administered. The items in the tests were based upon the statements of the units and their delimitations. Following the test, activities intended to interest and challenge the pupils and make them feel that they were about to engage in something worth-while were introduced.

The second phase is the laboratory period.[2/] Study guides were distributed and the pupils planned therefrom

1/ Billett, Roy O., Fundamentals of Secondary School Teaching, Houghton Mifflin Co., Boston, 1940, p. 599.

2/ Ibid., p. 600.

their activities for several class periods. As need arose the teacher worked with individuals, small groups, or with the entire class. During this stage a log of pupil-reactions and teacher-observations was kept. Revisions and adjustments in the unit assignment were made as a result. At the conclusion of this phase each pupil wrote a summary of what he had learned from his study to date.

The pooling of experiences phase [1] is the third step in the teaching-learning cycle. The pupils shared the results of their study, reports of committee work were given, exhibits explained, and a general summary of the unit made. Part of this work was programmed and conducted by a pupil chairman and part was teacher-conducted. Three class periods were devoted to the pooling of experiences phase.

The final phase of each unit was concerned with estimating the educative growth of each pupil. [2] During the preceding phases pupil progress had been noted in various ways and records kept. The same objective test which was given in the introductory phase was administered at this time and individual gains calculated. (See Tables 5 and 6, pages 12, 13, 14, and 15.) All pertinent facts were brought together in interpreting the results of the final test.

1/ Billett, op. cit. p. 602.

2/ Billett, op. cit. pp. 602-603.

Table 5 Initial Scores, Final Scores, and Number of Points Gained on the Objective Test for Unit I

Pupil	Initial Score	Final Score	Points Gained	Pupil	Initial Score	Final Score	Points Gained
1	31	64	33	41	52	66	14
2	34	65	31	42	52	65	13
3	36	54	18	43	53	88	35
4	48	73	35	44	53	80	27
5	38	59	21	45	53	85	32
6	41	55	14	46	53	78	25
7	41	59	18	47	53	74	21
8	42	62	20	48	53	70	17
9	42	76	34	49	53	67	14
10	43	56	13	50	54	82	28
11	43	81	38	51	55	71	16
12	43	89	46	52	56	78	22
13	44	90	46	53	56	76	20
14	45	52	7	54	56	74	18
15	45	97	52	55	57	89	32
16	46	69	23	56	57	85	28
17	46	93	47	57	57	84	27
18	47	57	10	58	58	83	25
19	47	71	24	59	58	78	20
20	48	71	23	60	58	68	10
21	48	77	29	61	59	83	24
22	48	79	31	62	59	81	22
23	49	56	7	63	59	78	19
24	49	61	12	64	59	69	10
25	49	62	13	65	60	80	20
26	49	65	16	66	60	79	19
27	49	85	36	67	60	74	14
28	51	88	37	68	60	74	14
29	51	76	25	69	60	71	11
30	51	78	27	70	61	90	29
31	51	78	27	71	61	85	24
32	51	78	27	72	61	84	23
33	51	52	1	73	61	83	22
34	51	73	22	74	61	81	20
35	51	68	17	75	61	80	19
36	51	68	17	76	61	78	17
37	51	64	13	77	61	74	13
38	52	72	20	78	62	84	22
39	52	53	1	79	62	81	19
40	52	72	20	80	62	91	29

Table 5 (continued)

Pupil	Initial Score	Final Score	Points Gained	Pupil	Initial Score	Final Score	Points Gained
81	62	89	27	116	68	87	19
82	62	87	25	117	68	86	18
83	62	75	13	118	68	86	18
84	62	73	11	119	68	80	12
85	63	85	22	120	69	92	23
86	63	79	16	121	69	90	21
87	63	93	30	122	69	89	20
88	63	91	28	123	69	89	20
89	63	80	17	124	69	88	19
90	63	80	17	125	69	85	16
91	63	77	14	126	69	85	16
92	63	74	11	127	69	81	12
93	63	70	7	128	69	79	10
94	64	85	21	129	70	91	21
95	64	75	11	130	70	91	21
96	64	72	8	131	70	85	15
97	64	72	8	132	70	80	10
98	64	67	3	133	70	76	6
99	65	85	20	134	71	93	22
100	65	81	16	135	71	85	14
101	65	80	15	136	71	85	14
102	65	78	13	137	71	73	2
103	65	73	8	138	72	93	21
104	66	87	21	139	72	89	17
105	66	86	20	140	72	86	14
106	66	86	20	141	72	85	13
107	66	83	17	142	72	84	12
108	66	82	16	143	72	79	7
109	66	79	13	144	72	83	11
110	66	79	13	145	74	87	13
111	66	74	8	146	76	88	12
112	66	72	6	147	77	82	5
113	67	97	30	148	80	94	14
114	68	91	23	149	82	94	12
115	68	90	22				

The average number of points gained was 19.

Table 6 Initial Scores, Final Scores, and Number of Points Gained on the Objective Test for Unit II

Pupil	Initial Score	Final Score	Points Gained	Pupil	Initial Score	Final Score	Points Gained
1	40	70	30	40	58	79	21
2	41	69	28	41	58	85	27
3	42	63	21	42	58	75	17
4	42	47	5	43	58	83	25
5	44	61	17	44	59	78	19
6	44	62	15	45	59	77	18
7	44	68	24	46	59	88	29
8	45	61	16	47	59	74	15
9	45	49	4	48	59	77	18
10	45	74	29	49	59	66	7
11	47	75	28	50	60	79	19
12	48	50	2	51	60	83	23
13	49	89	40	52	60	82	22
14	49	70	21	53	60	71	11
15	50	72	22	54	60	71	11
16	50	71	21	55	60	78	18
17	50	78	28	56	61	76	15
18	51	90	39	57	61	74	13
19	51	69	18	58	62	80	18
20	51	78	27	59	62	70	8
21	51	61	10	60	62	75	13
22	51	65	14	61	63	81	18
23	53	66	13	62	64	82	18
24	53	72	19	63	64	77	13
25	53	80	27	64	64	82	22
26	54	76	22	65	64	73	9
27	54	72	18	66	64	84	20
28	54	69	15	67	64	69	5
29	55	59	4	68	64	86	22
30	55	71	16	69	65	76	11
31	55	56	1	70	65	76	11
32	56	70	14	71	65	83	18
33	56	71	15	72	65	76	11
34	56	84	28	73	65	79	14
35	56	61	5	74	65	78	13
36	57	89	32	75	66	81	15
37	57	85	28	76	66	77	11
38	58	60	2	77	66	91	25
39	58	69	11	78	66	86	20

Table 6 (continued)

Pupil	Initial Score	Final Score	Points Gained	Pupil	Initial Score	Final Score	Points Gained
79	66	86	20	118	73	79	6
80	66	79	13	119	73	79	6
81	67	82	15	120	74	86	12
82	67	73	6	121	74	89	15
83	67	74	7	122	74	92	18
84	67	83	16	123	74	79	5
85	68	79	11	124	74	83	9
86	68	76	8	125	74	86	12
87	68	74	6	126	75	85	10
88	68	79	11	127	75	87	12
89	68	72	4	128	75	80	5
90	69	83	14	129	76	86	10
91	69	87	18	130	76	87	11
92	69	82	13	131	77	79	2
93	70	86	16	132	77	84	7
94	70	83	13	133	77	92	15
95	70	75	5	134	78	84	6
96	70	76	6	135	78	86	8
97	70	84	14	136	78	87	9
98	70	79	9	137	78	89	11
99	71	81	10	138	78	81	3
100	71	89	18	139	79	89	10
101	71	80	9	140	79	85	6
102	71	83	12	141	80	82	2
103	71	77	6	142	80	91	11
104	71	87	16	143	80	87	7
105	71	79	8	144	81	82	1
106	71	77	6	145	81	94	13
107	72	85	13	146	81	86	5
108	72	85	13	147	82	89	7
109	72	80	8	148	82	84	2
110	72	83	11	149	83	88	5
111	72	89	17	150	84	86	2
112	72	76	4	151	84	92	8
113	73	84	11	152	86	92	6
114	73	88	15	153	86	89	3
115	73	83	10	154	87	91	4
116	73	86	13	155	87	93	4
117	73	86	13	156	87	91	4

The average number of points gained was 13.

CHAPTER II

AN INTRODUCTION TO THE STUDY OF OCCUPATIONS

General statement of the unit.[1]-- Junior-high-school students should learn something about many occupations with a view to choosing a field of future work as early in life as possible.

Since pupils of junior-high age may change their minds about the kind of work they wish to do, and since changes are always taking place because of technological or other advances, any choice is necessarily tentative.

The delimitation of the unit.[2]--

1. Choosing a field of work is one of the most important tasks young people are called upon to do. Upon the intelligence of the choice depends much of one's future happiness and welfare.
2. Nobody should try to dictate to a young man or woman exactly which occupation to choose. It is the responsibility of each individual to choose for himself the field of work he is to enter.
3. Many studies of the occupational preferences of high school students have been made, and

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1/ Billett, op. cit p. 505

2/ Billett, op. cit. pp. 505-506

all show that choices were very limited. In one of these studies 83 per cent of all the students chose only ten occupations; 74 per cent chose vocations in the professional group; 42 per cent of the girls wanted to be teachers. From this it is evident that a much broader knowledge of occupations is desirable if a wise choice is to be made.

4. Junior-high-school students should think in terms of a general field of work rather than about a specific job. In learning about the world of work students will need to know how and where to get information on many kinds of work.

5. There are many ways of gaining occupational information. A few of them are:

    A. Talking with workers.

    B. Reading what workers have said about their jobs.

    C. Try-out experiences after school hours.

    D. Observing people at work.

    E. Listening to radio broadcasts on vocational problems.

6. Three different texts will be used a great deal in the study of occupations. They are:

A. Brewer and Landy, Occupations Today

B. Smith and Baron, Choosing Your Course

C. Davey, Smith, and Myers, Everyday Occupations

7. A very valuable source of occupational information is in pamphlet material. The following are in the school library:

   A. Careers Research Monographs

   B. Commonwealth Vocational Guidance Monographs

   C. Success Series Monographs

   D. Occupational Briefs

   E. Vocational and Professional Monographs

8. Books on vocations are listed in the library under 371.42.

9. A copy of the magazine Vocational Trends comes to our school each month. Much information of value can be found in this magazine material.

10. In studying an occupation we should become familiar with these basic facts:

    A. Importance of the occupation

    B. Required tasks

    C. Advantages and disadvantages

    D. Abilities needed

    E. Training desirable

    F. Future trends

11. Occupations will be studied in groups. A number of organizations have worked out systems for classifying them. The two main agencies are the Census Bureau and the Bureau of Employment Security.

12. The Census Bureau classification is:

    A. Professional and semi-professional workers
    B. Farmers and farm namagers
    C. Proprietors, managers, and officials except farmers
    D. Clerical, sales, and kindred workers
    E. Craftsmen, foremen, and kindred workers
    F. Operatives and kindred workers
    G. Domestic service workers
    H. Protective service workers
    I. Service workers except domestic and protective
    J. Farm laborers and foremen
    K. Laborers, except farm

13. The Unites States Census is taken once every ten years on the years which are multiples of ten. The most recent one was the sixteenth taken in 1940. The next one will be in 1950.

14. Sometimes occupations are grouped on the basis of the activities involved in them. Some deal with people, some with things, and others primarily with ideas.

15. Occupations may also be grouped according to the degree of skill they require. On this basis they may be classified as:

    A. Unskilled

    B. Semi-skilled

    C. Skilled

    D. Technical or professional

    Young people should aim for at least the semi-skilled level.

16. According to the Bureau of Employment Security in their publication Dictionary of Occupational Titles there are 17,452 different kinds of jobs in the United States.

17. The United States Employment Service office nearest us is at 140 Washington Street, Salem, Massachusetts.

18. Before choosing a field of work it is important to study your own interests and aptitudes. Many opportunities to do this come through school,--in the classrooms, shops, and clubs. Home also

offers opportunities to discover interests and abilities. Tests of mental ability and of specific abilities often help.

19. Interest in an activity is a tendency to give attention to it, to be attracted by it, to like it, or to find satisfaction in it.

20. An aptitude is a set of qualities which make it possible for a person to develop with training a certain type of knowledge or skill.[1]

21. From time to time your interest in and enthusiasm for a given occupational field will change. This is perfectly normal and is to be expected.

22. The special abilities required by an occupation may be named as follows:[2]

    A. Dexterity of fingers, hands, arms.
    B. Ability to deal with numbers
    C. Language ability
    D. Skill in routine work
    E. Mechanical ability
    F. Scientific ability
    G. Artistic ability

1/ Anthony J. Humphreys, How to Choose a Career Science Research Associates, Chicago, p. 30.

2/ Ibid. p. 23.

H. The ability to deal successfully with people

I. Executive ability

23. As you study certain groups of occupations and learn of abilities required, you should try to decide whether your abilities match those required. If you also have an interest in that occupation you may be successful in that line of work.

24. Many people have the idea that each person is fitted for only one kind of job, but experience shows that an individual can fit into several kinds of work if given the necessary training and opportunities.

25. One thing which must be kept in mind is that occupations change from time to time. New ones are added and old ones disappear. "It has been stated that 25 per cent of present-day workers are in occupations that did not exist 25 years ago, that during those years approximately three hundred occupations have gone out of existence, and that, in the future, 75 per cent of the working population will probably be in occupations that do not

now exist."[1]

26. Some of the changes which affect work are:

    A. Changes in methods of work

    B. New methods of travel and transportation

    C. Changes in ways of doing work

    D. Changes in style of clothes

    E. Use of new materials

    F. Power driven machinery

    G. Mass production[2]

27. A vocational trend is a tendency toward the greater development of an occupation, or it may be a decline in an occupation.

28. One great factor in shaping vocational trends has been technological progress. This kind of progress means any change that makes for greater efficiency in methods of production or in distribution of goods.

29. It is the responsibility of workers to see to it that all important changes result in benefit to the majority of the people.

1/ Mildred Lincoln Billings, Group Methods of Studying Occupations, International Textbook Company, Scranton, Pennsylvania, 1941, p. 14.

2/ John M. Brewer and Edward Landy, Occupations Today, Ginn and Company, Boston, 1943, pp. 40-43.

Probable indirect and incidental learning products.--

1. An appreciation of and respect for all socially useful work.
2. A desire to assume a helpful place in the world of work.
3. An interest in the further study of occupations.
4. Facility in the use of the unit assignment.

References for teachers' use only:--

Billings, Mildred Lincoln, Group Methods of Studying Occupations, International Textbook Company, Scranton, Pennsylvania, 1941.

Brewer, John M. and others, Case Studies in Educational and Vocational Guidance, Ginn and Company, Boston, 1926.

Humphreys, J. Anthony, How to Choose a Career, Science Research Associates, Chicago, Illinois, 1940.

Kitson, Harry D., I Find My Vocation, McGraw-Hill Book Company, Inc., New York, 1937.

The Unit Assignment.-- (Tentative time allotment, eight weeks, two periods per week.)

A. Introductory activities:

1. Read to the class the selection entitled "Get Ready" by Elihu Burritt. (6:35)[1] Explain that Burritt was known as the learned blacksmith. He studied as he worked and acquired a knowledge of languages. What does the author say concerning the inheritance of all youths of today? How can you get ready for your share of it?

2. Have you ever thought very much about the world of work? Why do people work? What place has work in the life of a person? If you had plenty of money, would you work? In your opinion what are the advantages to be gained by studying occupations?

33. Explain the adage: "Square pegs in square holes; round pegs in round holes." How does this apply to a choice of a field of work?

1/ Code to reading list. 6:35 means page 35 in the sixth reference in the reading list at the end of the assignment.

B. Core activities:

1. In a survey of occupational choices among high school students it was found that 83 per cent of the pupils chose from among ten occupations; 74 per cent chose vocations in the professional group, and 42 per cent of the girls wanted to be teachers. What do these results of the study prove to you?
2. To increase your understanding of the many kinds of workers in the world, make a list of at least twenty-five workers who helped to make your breakfast possible this morning.
3. On your way to and from school what workers do you see? Prepare a list.
4. Examine the picture in 1:19. How many of the thirty-four trades can you name?
5. You should be thinking in terms of a general field of work rather than about a certain job. Why is this wise?
   (1:10; 1:267-268; 9.)
6. Should you expect or want an older person to tell you which occupation to enter? Why? Can grown-ups help you in any way in the task of deciding upon an

occupation? Interview three people whose occupations are entirely different from each other, and ask them about the good points and undesirable features of their work. Prepare a brief written summary of the interviews.

7. List as many ways as you can think of to obtain information about the world of work. (1:30-31; 1:52, 58.)
8. Examine the three textbooks which we have, paying particular attention to the tables of contents so that you may get an idea of the kind of information they contain.
9. Visit the library soon and examine the books on vocations. These will be numbered 371.42. List five or six which you think you might find useful in your study of occupations this year. List also the collections of pamphlet material which are there.
10. Some back numbers of the magazine Vocational Trends are available, and

the current issue will be here soon. Look at some of the issues and discover for yourself the kind of information in them.

11. Look over some studies of occupations and decide what information the various writers seem to feel should be included. Using the best ideas you have, work out an outline of your own--one which you would like to use in studying occupations for the rest of the year. Groups of three or four pupils may work on this together if they wish. (1:9, 25; 8: 334-338; 6; 10; 11; 12; 13.)

12. There are two main agencies in the United States which classify workers. What are they? What is the principal work of each?

13. List the eleven U. S. Census classifications. Beside the name of each group indicate what per cent of all workers belong in that group. (1:20.)

14. How often is the U. S. Census taken? What was the date of the most recent one? When will there be another? (1:16-17.)

15. When occupations are grouped on the basis of the activities and abilities involved, they may be divided into three groups. Name and describe each group. (3:20-24.)

16. Explain what is meant by levels of work. (a) unskilled, (b) semi-skilled, (c) skilled, (d) professional. (8:14-20; 1: 263-266.)

17. How many different kinds of jobs are there in the United States? (1:22;7.)

18. Look in a telephone directory and find the address of the United States Employment Service office nearest us. You will find it in the classified directory at the back of the book.

19. In your reading about choosing a field of work you will find that the words interest, ability, and aptitude are used over and over again. What do these words mean?

20. How can school subjects and activities help you to discover your interests and abilities? How can home activities help? Are tests of any value? (1:49-55; 9.)

21. What is the best plan for people with many sided abilities? How does the life

of Samuel F. B. Morse illustrate this? (3:17-18; 1:11.)

22. Answer fairly the questions in the "Self-Analysis Questionnaire". (3:26-27.)

23. Study the table in 1:37-38 to determine which occupations show gains and which show losses. Select any three or four and explain the changes.

24. What are some of the changes which affect work? (1: Chapter 3; 3:261-264.)

25. Study some relative's occupation and find out: (a) whether or not it existed one hundred years ago, (b) how it has changed in the last twenty-five years, (c) what changes seem likely to take place in the near future.

26. What is a vocational trend? (3: 253.)

27. What is meant by technological change? How does it affect occupations and employment? Why should you as a student be concerned with an unemployment situation? (3:255.)

28. "Know yourself" and "Know your work and be willing to give your best effort to it" are two sayings that you should keep

in mind when you are trying to decide upon an occupational field. How can your school studies help you to know more about occupations? (1:54-55, 62-72.) How can your out-of-school activities help?

29. Which occupations appeal to you? What do these occupations require of workers? How much mental ability is needed? Are any special abilities essential? Do your interests and abilities match the requirements of the work?

30. Some occupations require certain skills. Name an occupation or two requiring: (a) dexterity of fingers, hands, and arms, (b) ability to deal with numbers, (c) language ability, (d) skill in routine work, (e) mechanical ability, (f) scientific ability, (g) artistic ability, (h) the ability to deal successfully with people, (i) executive ability.

31. Are there any occupations open to you today which were not open to your parents? Do you think occupations will change in the next twenty-five years? How can you be prepared for change if it comes? (1:36-40; 6: 47-48.)

32. What steady jobs might you work into as a result of work you do after school, on Saturdays, or during the summer vacation periods?

33. When we finish this unit of work, we shall study about many occupations. Keep your own interests and abilities in mind and perhaps before the year is over you will have some idea as to the kind of work you would like to do.

C. Optional related activities:

1. Collect pictures of people at work in various occupations for our bulletin board. Mount them and plan to display them effectively. Advertisements in magazines are a good source of picture material. Try to get pictures to illustrate workers in the different Census classifications.

2. What prediction did Malthus make over a century ago? Why didn't his prediction come true? (3:253.) Also, consult an encyclopedia for further information on this topic. Write a brief report of your study.

3. Read Chapter IX, "Analyzing Yourself", in <u>I Find My Vocation</u> by Kitson. Prepare a chart in which you show an analysis of your own traits.

4. Look at the help wanted page of a Boston newspaper and try to decide under which census classification the work offered would come. In preparing this activity make headings based upon the census classifications and then paste each help wanted ad under the suitable heading. You may display your work on the bulletin board.
5. A committee of three or four students may collect the outlines done by class members under activity 11 in the assignment. Select the one which seems best, revise it, and we shall adopt it as our basic outline for the study of an occupation.
6. How has the automobile changed our way of living? What occupations have developed because of the increase in the number of automobiles? (3:258-259.) Have any occupations suffered a decline because of the use of the automobile? This activity could be developed in either poster or composition form.
7. Contrast the way in which any kind of work was carried on a hundred years ago with the way in which it is done today.

   Examples: Farming; Shoe-making.

   Prepare a written report.

8. Go to the library soon and examine some collection of poetry with the idea in mind of making a collection of poems on the subject of work.

Examples: "Work" by Van Dyke
"Work" by Morgan
"The Music of Labor"-
Anon.

You may want to make a booklet of the eight or ten selections which you like best of those you find.

9. What arguments could you present to the anxious father who said, "Everything seems to have been done." (4:17.)

Write out your ideas.

10. List in one column the occupations of at least ten different people whom you know. In a parallel column classify these occupations according to the eleven main divisions of the United States Census. In a third column classify these occupations according to the divisions of the United States Employment Service classification.

11. What is the difference in meaning between the term <u>occupation</u> and <u>job</u>? Consult a dictionary

and explain in writing any difference in meaning that you find.

12. Workers describe their jobs in various ways, such as tiring, respectable, or productive. Some of the labels attached to work are described in 1:23-25. Read this section and prepare a report on it. If you wish to make your report orally plan for it with the teacher.

13. There are many unusual or odd ways of making a living. Can you gather some information on any of them? Your best source of material will be newspapers and magazines.

14. Newspapers and magazines often print articles of vocational interest. While we are working on this unit, see how many you can find. Cut them out and mount them on notebook paper.

15. What personal qualities are necessary for success in work? What are some of the principal reasons for discharge from work? (1:93-95.) This activity could be developed into an interesting easy-to-read table or outline.

16. Even though changes are taking place constantly, many things of value remain with us permanently. What are some of these permanent values? (3:265-266; 1:56-58.)

Prepare a brief written summary of your study.

17. How many ways can you think of in which electricity affects our lives? Make a list of them. If possible illustrate the items in your list.

18. Collect or draw some pictures that show technological change. Write suitable titles for the pictures.

References for Pupils' Use.--

TEXTS:

1. Brewer, John M. and Edward Landy, Occupations Today, Ginn and Company, Boston, 1943.

2. Davey, Mildred A., Elizabeth Smith and Theodore R. Myers, Everyday Occupations, D. C. Heath and Company, B oston, 1941.

3. Smith, Charles M. and Samuel Baron, Choosing Your Course, Henry Holt and Company, New York, 1942.

OTHER REFERENCES:

4. Careers Research Monographs, The Institute for Research, Chicago.

5. Cohen, I. David and Mary K. Ganley, Careers, Thomas Nelson and Sons, New York, 1938.

6. _____, Opportunity, Thomas Nelson and Sons, New York, 1938.

7. Dictionary of Occupational Titles, Parts I and II, Department of Labor, United States Employment Service, United States Printing Office, Washington, D. C. 1939.

8. Holbrook, Harold Lyman and A. Laura McGregor, Vocations and School, Allyn and Bacon, Boston, 1940.

9. Kitson, Harry Dexter, Selecting a Career, The Institute for Research, Chicago, 1936.

10. Occupational Briefs, Science Research Associates, Chicago.

11. Success Monographs, Morgan Dillon and Company, Chicago, 1937.

12. Vocational Information, The World Book Encyclopedia, The Quarrie Corporation, Chicago.

13. Vocational and Professional Monographs, Bellman Publishing Company, Inc., Boston, Massachusetts, 1941-1946.

14. Waltz, George H. Jr., What Do You Want to Be?, Henry Holt and Company, New York, 1939.

MASTERY TEST

PART I

Directions: Some of the following statements are true and some are false. If in your opinion the statement is true, place a plus sign in the parentheses before it; if false, place the zero sign in the parentheses. Remember, if any part of the statement is false, the statement as a whole is counted false.

( ) 1. Technological progress means any change that brings about greater efficiency in ways of doing work.

( ) 2. The Census Bureau classifies occupations under fourteen headings.

( ) 3. Farm laborers make up the largest occupational group.

( ) 4. The work of a typist demands executive ability.

( ) 5. Frequently radio broadcasts give valuable information about occupations.

( ) 6. Mass production is the making of large quantities of goods quickly and cheaply.

( ) 7. Power driven machinery has been responsible for many changed working conditions.

( ) 8. Occupational information cannot be obtained by watching people at work.

( ) 9. Pamphlets entitled Vocational and Professional Monographs may be obtained in the school library.

( ) 10. A vocational trend is a tendency for an occupation to remain unchanged.

( ) 11. No occupation has escaped changes of one kind or another.

( ) 12. Before this school year is over, everyone in the class should know exactly which job he is to train for.

( ) 13. New methods of doing home tasks have affected work in the last twenty-five years.

( ) 14. Experience shows that an individual can fit into several kinds of work if given the necessary training.

( ) 15. The automobile and airplane have had slight effect on work.

( ) 16. Our interests and abilities should match the requirements of the occupational field we are planning to choose.

( ) 17. Many people have the idea that each person is fitted for only one kind of job.

( ) 18. The United States Employment Service office nearest us is in Boston.

( ) 19. Some occupations deal with people, some with things, and some with ideas.

( ) 20. Young people should be content with preparing for jobs on an unskilled level.

( ) 21. It is to be expected that one's interest in a certain occupation will change from time to time.

( ) 22. The Dictionary of Occupational Titles is a publication of the United States Census Bureau.

( ) 23. Junior-high students should not change their minds after deciding to enter a certain occupational field.

( ) 24. Education or vocational training is not as important now as it was twenty-five years ago.

( ) 25. Collecting information on a number of occupations is not a necessary step in deciding upon a field of work to enter.

( ) 26. During the last twenty-five years about three hundred occupations have gone out of existence.

( ) 27. In studying an occupation we should determine what abilities are needed in that line of work.

( ) 28. In the future there will be few new occupations added.

( ) 29. Two agencies which classify workers are the Census Bureau and the Bureau of Social Security.

( ) 30. Books on occupations will be found listed 960.32 in the library.

( ) 31. Interest in an activity is the power to perform tasks required by the activity.

( ) 32. Craftsmen and operatives are two groups of workers listed in the United States Census.

( ) 33. Some occupations require skill in routine work while others require the ability to deal successfully with people.

( ) 34. At your age it is advisable to choose a field of work instead of a particular job.

( ) 35. Changes in styles of clothes are responsible for changes in work.

( ) 36. Whatever changes come, workers should try to have them benefit most of the people.

( ) 37. An aptitude is a set of qualities which make it possible for a person to develop with training a certain kind of knowledge or skill.

( ) 38. Boys and girls should study for the occupations which their parents choose for them regardless of their own abilities.

( ) 39. The most recent census was the seventeenth.

( ) 40. One investigation showed that 74 per cent of the high school students questioned in a recent survey chose occupations in the professions.

( ) 41. Several levels of skill are found in nearly every occupation.

( ) 42. One of our text books is entitled Choosing Your Career.

( ) 43. The most important point to consider in choosing an occupational field is how much money can be earned.

( ) 44. Some of the best occupational material is found in pamphlet form.

( ) 45. Work experiences out of school hours are a waste of time as far as giving information about occupations is concerned.

( ) 46. Of the girls questioned in a survey, 50 per cent wanted to be teachers. This shows a slight knowledge of occupations.

( ) 47. The next census will be taken in 1950.

( ) 48. Studies in the past have shown that high school students know a great deal about the world of work.

( ) 49. Talking with workers and reading what some have said about their jobs are valuable means of obtaining occupational information.

( ) 50. The United States Census is taken every five years on the years that are multiples of five.

TEST

PART II

Directions: All omitted words or phrases appear in the column at the left of the page. Put the number of the blank in the correct parentheses at the left.

A.

( ) varied
( ) limited
( ) 74 per cent
( ) ten
( ) twenty
( ) 83 per cent
( ) 50 per cent
( ) wide
( ) 25 per cent
( ) 42 per cent

The choices of occupations made by high school students are __1__. In a study of occupational choices of high school pupils it was learned that __2__ of all the students chose __3__ occupations. __4__ chose occupations in the professional group and __5__ of the girls wanted to be teachers.

B.

( ) definite job
( ) field of work
( ) discontent
( ) speed
( ) intelligence
( ) allow

Choosing a __1__ is one of the important tasks young people are faced with. Upon the __2__ of the choice depends much of one's future. __3__ Older people should not __4__

( ) young people
( ) opportunity
( ) happiness
( ) dictate

to __5__ exactly which occupation to choose.

C.

( ) up-to-date
( ) vocations
( ) 900.37
( ) future trends
( ) text book
( ) pamphlet
( ) 498.63
( ) aptitude
( ) talks with workers
( ) 371.42

__1__ are helpful in gaining occupational information. Occupations Today is a __2__ which gives __3__ information about the world of work. Books on __4__ are listed under __5__ in our library.

D.

( ) five
( ) ten
( ) 1955
( ) sixteenth
( ) Employment Security Bureau
( ) tenth
( ) 1950
( ) seventeenth
( ) United States government
( ) United Stated Census

The __1__ is taken once in every __2__ years. The next one will be taken in __3__. The last one was the __4__ to have been completed. This work is done by the __5__.

E.

( ) United States Census
( ) thousands
( ) very few
( ) eleven
( ) Dictionary of Occupational Titles
( ) Bureau of Employment Security
( ) hundreds
( ) thirteen
( ) basic outline
( ) semi-skilled

The __1__ is a publication of the __2__; it tells that there are __3__ of different kinds of jobs in the United States. The __4__ divides workers into __5__ groups.

F.

( ) outside
( ) wise
( ) wishes
( ) foolish
( ) school
( ) plays
( ) observant
( ) interests
( ) citizen
( ) opportunities

If the __1__ furnished by the __2__ and by __3__ activities are used intelligently, a person may be helped in deciding where his __4__ lie. We need a __5__ choice of work.

G.

( ) professional
( ) three
( ) social
( ) semi-skilled
( ) interest
( ) six
( ) skill
( ) clerical
( ) four
( ) unskilled

Occupations may be grouped according to the amount of 1 required. Work on the lowest level is 2 ; on the highest level it is 3 . Young people should aim for at least the 4 level. In all, there are 5 levels.

H.

( ) correct
( ) abilities
( ) occupation
( ) be different
( ) match
( ) good
( ) one
( ) training
( ) trend
( ) mistaken

Our 1 should 2 those required by the 3 we are considering.

Many people have the 4 idea that a person is capable of doing only one kind of work. With 5 a person can fit into several jobs.

I.

( ) decline
( ) choice
( ) intelligence
( ) changes
( ) science
( ) mass production
( ) limits
( ) trend
( ) dictation
( ) development

A vocational ___1___ is a tendency toward the greater ___2___ of an occupation, or it may be a ___3___ in that occupation.

There are many ___4___ which have affected work; one of these is ___5___.

J.

(2) Vocational Trends
( ) advertising
(1) pamphlet
( ) aptitudes
( ) picture
( ) three hundred
(3) required tasks
( ) Vocations and School
(4) change
( ) fifty

One of the best sources of occupational information comes in the form of ___1___ material. The magazine to which we subscribe is called ___2___.

In studying an occupation we should become familiar with the ___3___ of the job.

Occupations ___4___ from time to time. In the last twenty-five years about ___5___ jobs have gone out of existence.

CHAPTER III

PROFESSIONAL WORKERS

General statement of the unit.-- A professional worker is one whose work requires scientific or technical training equal to that represented by graduation from a college or university.[1] The census reports show that about seven per cent of all workers are in the professional and semi-professional group.

To become a professional worker requires a long period of preparation as well as certain natural aptitudes.

Before making a definite choice, one who thinks he would like to work in the professions should be reasonably sure that he has the required abilities, and he should consider carefully what he will have to do after entering upon the profession.

The delimitation of the unit.--

1. The earliest professions were theology, law, and medicine.[2] Now the field has broadened, but there are still three main groups of professional

1/ Adapted from the Alphabetical Index of Occupations, Sixteenth Census of the United States, United States Government Printing Office, Washington, D. C., 1940.

2/ The content of the delimitation was adapted in the main from John M. Brewer and Edward Landy, Occupations Today, Chapter XIII, Ginn and Company, Boston, Massachusetts, 1943.

workers: (1) those who make use of the sciences, (2) those who make large use of writing and speaking, and (3) those who deal chiefly with people. Workers in the third group may make use of the abilities required of one or both of the first two.

2. The chief professional workers who use the sciences are the architects, engineers, physicians, surgeons, dentists, trained nurses, and pharmacists.
3. The architect is a kind of engineer and also an artist. To prepare for work as an architect a high school student should give special attention to drawing, mathematics, and if possible some modern language. Later training should include a college academic course and a course in architecture.
4. In addition to the architect who plans buildings, there is also the landscape architect who plans gardens, walks, walls, forests, and other scenic features.
5. Some of the workers in engineering are the civil engineer, the municipal and sanitary engineer, the mechanical engineer, the electrical engi-

eer, the mining engineer, the metallurgical engineer, the industrial chemist, the aeronautical engineer, the air-conditioning engineer, and the radio engineer.

6. The railroad engineer and the stationary engineer are not classified as professional workers. College education is not required of them.
7. A student who finds methematics and science difficult for him should avoid engineering as a career.
8. The world of work has room for more practically trained or semi-professional engineers than trained graduates of a four year college course in engineering. The junior colleges and technical institutes are training many such workers.
9. There have been very few women engineers of great importance, but if a young woman has outstanding ability in mathematics and science, she may succeed in engineering tasks.
10. Physicians, surgeons, and dentists also use science in their work, but theirs are such sciences as physiology and anatomy.

11. To be successful in the field of medicine one should have a strong body, a cheerful disposition, honesty of purpose, and love for the work.
12. The training for a doctor requires at least two years of college, four years in medical school, and a year or two of internship in a hospital. Additional training is required of the specialist.
13. From four to five years after graduation from high school are usually required for training as a dentist. Besides skill in his work a dentist must have the ability to get along with people under trying circumstances.
14. The period of training for a pharmacist is much shorter than for other occupations in the field of medicine. In addition to ability in his profession the pharmacist should be a good salesman and businessman.
15. To undergo training as a nurse a person must be a graduate of a high school. Then a nurses' training school in connection with some hospital must be attended usually for a period of from two to three years. The

graduate nurse may continue her work in a hospital, become a home nurse, or enter some specialized branch of nursing such as dental nursing, industrial nursing, or school nursing. Nursing offers fine opportunities for service. The nurse must have good health, tact, poise, and patience.

16. Those who make use of speaking and writing activities are journalists, authors, lawyers, librarians, and actors.

17. Newspapermen and newspaper women are called journalists. The work is hard, the hours are long and irregular, and a special type of writing skill is required.

18. When a writer works on his own time rather than as a staff member of a publication, he is called "a free lance". He may write articles, short stories, novels, plays, or radio scripts.

19. Many of the greatest men in our nation are lawyers. The period of training is long and a lawyer must be well-informed on many subjects. Bar examinations are becoming so difficult that only about fifty per cent of those who take them actually pass.[1]

1/ Charles M. Smith and Samuel Baron, Choosing Your Course, Henry Holt and Company, New York, 1942, p. 134.

20. The librarian should be a person of great and varied ability. Literary skill, executive ability, business judgment, and a knowledge of books and human nature are a few of the abilities needed.

21. Actors and actresses often spend years in studying for their work. Hours and hours of training and rehearsal are a part of each actor's job which is by no means an easy one. The motion picture and radio industries offer many opportunities for work in the field of acting. Try-out experiences may be had in school plays, but because a student has been successful in a school play does not necessarily mean that he is ready for the work of an actor or actress. Very few can really use acting as a way of making a living.

22. Workers who deal chiefly with people are clergymen, teachers, and social workers of various kinds.

23. The word clergyman includes those in charge of churches of all denominations. Only men of excellent qualities of character and leadership are fitted for the clergy.

24. No occupation is more varied than that of teaching. Positions range all the way from teaching in ungraded rural schools to administrative positions such as that of superintendent and college and university presidents. The demand for special teachers has increased in recent years. Special teachers of drawing, music, art, physical education, manual training, and home economics are found in the modern school.

25. The chief kinds of social workers are case workers, recreational directors, workers in institutions, club sponsors, and camp leaders. All of these workers are concerned with the well-being of people.

26. Among the semi-professional occupations are those of aviator, commercial artist, draftsman, designer, photographer, optometrist, radio operator, showman, embalmer, and undertaker. These are classified as semi-professional because the amount of training required is less than that of professional workers.

27. Professional standards of service, honesty, and love for work need to be extended to all fields of work.

Probable indirect and incidental learning products.--

1. A growing awareness of the necessity for self-analysis before deciding upon a career.
2. An appreciation of the high ethical standards which characterize most professions.
3. A realization of the importance of school in relation to later success in work.
4. Ability to find material relevant to the question to be studied.

References for teachers' use only.--

Billings, Mildred Lincoln, Group Methods of Studying Occupations, International Textbook Company, Scranton, Pennsylvania, 1941.

Detjen, Mary E., Ford and Ervin W. Detjen, Home Room Guidance Programs for the Junior High School Years, Houghton Mifflin Company, Boston, 1940.

Lingenfelter, Mary R., Vocations in Fiction, American Library Association, Chicago, 1938.

Parker, W. E., Books About Jobs, American Library Association, Chicago, 1936.

The Unit Assignment.-- (Tentative time allotment, eight weeks, two periods per week.)

A. Introductory activities:

1. What ideals are expressed in the following poem?

"Work thou for pleasure--paint or sing or carve
The thing thou lovest, though the body starve--
Who works for glory misses oft the goal;
Wh o works for money coins his very soul.
Work for the work's sake, then, and it may be
That these things shall be added unto thee."

--Kenyon Cox

Can you name some occupations where these ideals prevail? In what occupational group do they belong? Perhaps you can find some other literary selections which express similar thoughts.

2. At the conclusion of Unit I for purposes of comparison later in the year, the members of the class were asked to indicate their present choice of a field of work. Compute the percentage of those who chose work in the professions. The figure will probably be high. Point this out and also that allowing for many changes we should probably not expect more than 20 to 25 per cent of the class to enter the professions. Refer to the figures in the 1940 census and find out what per cent of the workers in the United Stated are in the

professional and semi-professional group. How many in the class are likely to change their minds or be disappointed?

B. Core Activities:

1. What are the professions? How may professional workers be grouped? (3:113; 1:198.)
2. What professional workers (a) use the sciences (1:199); (b) use speaking and writing (1:211), and (c) deal chiefly with people? (1:220-226.)
3. Look up the meanings of the following professional titles:

A. B.	D. D. S.	M. D.
B. S.	L L. D.	PH. D.
C. E.	M. A.	R. N.
C. P. A.	A. M.	V. S.

Use your dictionary for this.

4. Among your friends and acquaintances are, without a doubt, a number of professional workers. Can you name one or two in each of these occupations:

Physician	Surgeon	Dentist
Nurse	Pharmacist	Engineer
Architect	Lawyer	Librarian
Clergyman		

Add to this list if you have friends or acquaintances in other professions.

5. What are some of the duties of an architect? If you are interested in becoming an architect, to what school subjects should you give special attention? How much education beyond high school will be required? (7:154-164; 1:201; 3:110; 5:310; 14: No. 58; 10:200.)
6. Name several kinds of engineers and be able to give some information as to the kind of work they do. (1:202-203; 7:61-70; 14: Nos. 26,27, 28; 13:288-292; 12:68-75.)
7. Have you ever watched an engineer at work? If so, describe what he was doing?
8. Who should not go into engineering? (1:203; 10:273-274.)
9. What is the difference between an electrician and an electrical engineer; a machinist and a mechanical engineer? (7: Chapters IV and V; 10:274-275.) Read "The Thinker" by Berton Braley. How does this poem help to answer the question? (10:275.)
10. Is it possible to work in the engineering field without graduating from a four year college course? Explain your answer. (1:203)
11. What professional fields are practically closed to women workers? (1:204; 213.)

12. To be successful as a physician what traits are necessary? How much education is required? (1:204-206; 2:280-290; 14: No. 36; 12: Chapter 18; 13:243-249.)
13. What are the training requirements for nursing? Describe some of the specialized branches of the nursing profession. (1:208-209; 2:298-304; 3:132: 14: No. 37; 13:15-25.)
14. Why is it desirable for a person who wants to be a pharmacist to have business ability? Compare a modern drug store with an old-time drug store. (1:209-210; 2:295-297; 7:84-95; 14:No. 101; 12:Chapter 18.)
15. What are some of the advantages and disadvantages to be found in the profession of dentistry? (1:207; 2:293-295; 7:96-104; 14: No. 112; 12:Chapter 18; 13:250-255.)
16. In what sense are some of the professions overcrowded? (3:134.)
17. What community needs are there for more professional workers? (3:135.)
18. "There is always room at the top." How does this apply to the professions?

19. What qualities must a journalist possess? In what school studies should you be excellent if you are thinking of journalism as a career? (1:211-212; 7:189-198; 5:319-325; 14:No. 89; 12:110-115; 13:153-154.)

20. A fine account of the work of free-lance writers is given in "Occupational Brief" 121. Read it. See also 13:153-164.

21. What are some of the duties of a librarian besides the obvious one of supervising the lending of books? (1:216-217; 7:220-229; 14:No. 115; 13:64-74.)

22. What are the opportunities for success in the lawyer's profession? What are some of the drawbacks in this profession? (1:214-216; 7:230-241; 10:320-322; 14:No.135; 12:147-152; 13:256-261.)

23. What opportunities for actors and actresses are available today? Does the future of this profession look promising or not? Why? (14:No. 130; 1:218-220.)

24. What qualities do you admire most in a teacher? Compare your list with the qualities mentioned in 1:220. If you are interested in teaching, check on your own aptitude for the

work. (10:300-305; 14:No.65; 13:37-50; 12: 225-230.)

25. In the Dictionary of Occupational Titles Part II you will find a complete list of professional occupations. Prepare a page on which you will write this list. Another page for semi-professional workers may be prepared.

26. Explain the difference between work on a professional level and on a semi-professional level. (3:130.)

27. What is meant by professional standards or ethics? Should any of these be found in other occupations? Explain your answer. (1:198; 3:121.)

28. Why is the amount of money made not the accepted standard of success in the professions?

29. Can you think of some good reasons for entering a profession? What would some poor reasons be? In what ways are the professions alike?

30. What course in high school will prepare you for the additional training needed before entering any of the professions? If you

are interested in a profession ask yourself:

1. Are my marks in English and arithmetic "B" or better?
2. If not, is it because I am not working up to capacity or because I lack ability in those subjects?
3. Have I the ability to get along with people?
4. Can my family afford to allow me to study for a professional career?
5. Do I know what demands the work will make?
6. Am I prepared to meet those demands?

31. Young people often make such statements as these:

1. "I want to be a teacher because teachers do not have to work hard."
2. "I think I'll become a lawyer because lawyers earn a lot of money."
3. "Engineering is wonderful. Engineers build famous buildings, tunnels, and bridges and become famous themselves."

If one of your friends had made any of the above statements what reply would you have made?

32. Choose an occupation from each of the three professional groups and prepare reports on them. Plan your work according to the outline worked out in Unit I. Use any of the references but especially 4, 7, 14, 16, and 18.

C. Optional related activities:

1. Collect pictures which show professional people at work. Mount them and prepare a bulletin board display. If you want to, you may ask members of the class to contribute to the collection. Wait until you have many pictures to choose from before mounting any. Get into your display as wide a variety of professional activities as you can.

2. Prepare a panel discussion in which the members of the panel represent different professions. Each member is to give a short talk on the profession he represents and must be prepared to answer any reasonable questions which other members of the panel or the class may ask.

Choose someone to act as chairman. It will be his duty to introduce the

speakers and subject.

3. Consult an encyclopedia for information on Hippocrates, the "Father of Medicine". You may either write a report of your findings or prepare a talk to be given to the class. When you decide how to present this, let the teacher know.
4. What sections of the "Oath of Hippocrates" apply as much today as in the days of Hippocrates? You will find the oath in 6:313. Write the answer to the question.
5. Draw a caduceus, the winged serpent-twined staff of Mercury often used as a symbol of the medical profession. To go with the drawing write an explanation of its meaning. You will find the information you need in a book of mythology. See: Frances S. Sabin, Classic Myths That Live Today, Silver Burdett and Company, Boston, 1927.
6. Anyone who is a Girl Scout might explain to the class what she will have to learn to get a merit badge for home mursing.
7. The best way to get some information on the duties of a clergyman would be to

talk with one about his work. Prepare some questions which you would like to have him answer. You may report either orally or in writing on this activity. These references may help you: (1:213-214; 10:289-292; 14:No. 91; 13:262-266; 12:140-146.)

8. Girls interested in nursing should be familiar with "The Nightingale Pledge". Learn the main points. (6:314.)

9. What is the work of the Rockefeller foundation? If you would care to give a talk to the class on this topic, speak to the teacher about it.

10. A common sign of the pharmacist's profession is the mortar and pestle. What are they? You might illustrate your answer. As a part of this activity why don't you find the meaning of the ℞ so frequently seen in drug stores and always on doctors' prescription blanks.

11. The book list of vocational fiction suggests many books that contain information on the professions. You may find it worth-while to read one of these books

and report on it to the class. In making your report be very sure to stress the occupational information you obtained from reading the book.

12. If you are interested in journalism, write a news article for the next issue of the school paper. Prepare a suitable headline to go with the article.

13. What housing problems face the United States at the present time? What professional workers will be required to help solve these problems?

14. Before we began this unit each pupil expressed his choice of an occupational field. A group of pupils may take the list and prepare a table showing how many chose the various occupations. Group the occupations chosen according to the census classification. Then make a graph to show the results.

15. What is meant by research? Describe the results of some recent research activities. Recent issues of magazines will give you material for this activity. See

Vocational Trends, "Science Works for you", January, 1946; "Plans for Plastics", December, 1945; "Research in Textiles", December, 1945.

16. Write a biographical sketch of some successful worker in one of the professions. For suggestions see the classified list of biographies in I Find My Vocation by Harry Dexter Kitson, pp. 72-90j.

17. A group interested in debating may spend considerable time planning a debate. The following topic is suggested: Resolved that there are greater employment opportunities in the professional occupations for young people today than in any other field of work.

References for pupils' use.--

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3. Smith, Charles M. and Samuel Brown, Choosing Your Course, Henry Holt and Company, New York, 1942.

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4. Careers Research Monographs, The Institute for Research, Chicago.

5. Cohen, I. David and Mary K. Ganley, Careers, Thomas Nelson and Sons, New York, 1938.

6. _____ Opportunity, 1938.

7. Cottler, Joseph and Harold Brecht, Careers Ahead, Little, Brown, and Company, Boston, 1935.

8. Dictionary of Occupational Titles, Part II.

9. Educational Opportunities of Greater Boston for Adults, Prospect Union Educational Exchange, Cambridge, 1946-1947.

10. Holbrook, Harold Lyman and A. Laura McGregor, Vocations and School, Allyn and Bacon, Boston, 1940.

11. Keleher, Alice V., Editor, Picture Facts Books: News Workers, Nurses at Work, Library Workers, Doctors at Work, Harper Brothers, New York, 1941.

12. Kitson, Harry D. and Mary Rebecca Lingenfelter, Vocations for Boys, Harcourt, Brace and Company, New York, 1942.

13. Lingenfelter, Mary Rebecca and Harry D. Kitson, Vocations for Girls, Harcourt, Brace and

Company, New York, 1939.

14. Occupational Briefs, Science Research Associates, Chicago.

15. Occupational Reprints, Science Research Associates, Chicago.

16. Success Monographs, Morgan Dillon and Company, Chicago, 1937.

17. Vocational Information, World Book Encyclopedia, The Quarrie Corporation, Chicago.

18. Vocational and Professional Monographs, Bellman Publishing,Co., Boston, Mass., 1941-1946.

19. Waltz, George H. Jr., What Do You Want to Be? Henry Holt and Company, New York, 1939.

MASTERY TEST

PART I

Directions: Some of the following statements are true and some are false. If in your opinion the statement is true, place a plus sign in the parentheses before it; if false, place the zero sign in the parentheses. Remember, if any part of the statement is false, the statement as a whole is counted false.

( ) 1. The earliest professions were theology, law, and medicine.

( ) 2. Professional workers who deal chiefly with people may also make large use of speaking, writing, and scientific activities.

( ) 3. Architects, engineers, and surgeons make more use of writing activities than of science.

( ) 4. An architect must have the abilities of an artist and engineer.

( ) 5. A railroad engineer is usually a college graduate.

( ) 6. Junior colleges and technical institutes are graduating many practically trained men for work in engineering.

( ) 7. Engineering is a field of work in which many women have reached positions of great importance.

( ) 8. The training for a doctor includes a year or two

of internship in a hospital.

( ) 9. An interest in a profession is sufficient to guarantee a person's success in the work.

( ) 10. The census reports show that about twelve per cent of all workers are in the professions.

( ) 11. Before selecting a profession as a career, a person should know what he will have to do after entering that profession.

( ) 12. Because a pharmacist is concerned only with mixing medicines it is not important that he know anything about managing a business.

( ) 13. Schools of nursing will accept, for training, girls with two years of high school education.

( ) 14. Journalists, lawyers, librarians, and actors make use of speaking and writing activities.

( ) 15. Disadvantages in the work of a journalist are the long, irregular hours.

( ) 16. A free-lance is one who is regularly employed on the staff of a newspaper.

( ) 17. Bar examinations have become so difficult in recent years that only fifty per cent of those who take them actually pass.

( ) 18. A student who has done well in a school play should seriously consider acting as a career.

( ) 19. The word clergyman includes those in charge of churches of all beliefs.

( ) 20. The variety of positions available in the teaching profession is very wide.

( ) 21. The demand for special teachers has decreased in recent years.

( ) 22. The aviator, draftsman, designer are professional workers.

( ) 23. The photographer, radio operator, and optometrist are classified as semi-professional because the amount of training required is less than that of professional workers.

( ) 24. An aptitude for a certain kind of work without an interest in it is not enough to insure success.

( ) 25. Students who think they may want to enter one of the professions later should try to make an excellent school record.

( ) 26. The physician advertises his work and does much work for patients without pay.

( ) 27. Towns and cities do not need the services of engineers.

( ) 28. If a student is poor in mathematics and science, he should consider engineering as a career.

( ) 29. Surgeons and dentists need to be skillful with their hands.

( ) 30. The training necessary to become a doctor is inexpensive.

( ) 31. There are more women employed in nursing than men.

( ) 32. Hospital training for a nurse usually takes three years.

( ) 33. Librarians, lawyers, and actors make great use of science in their work.

( ) 34. Many of the greatest men in our country are or have been lawyers.

( ) 35. The lawyer needs to be well informed on many subjects because he cannot tell ahead of time just what he will be expected to know.

( ) 36. Opportunities for careers in acting are fewer since the radio has become so popular.

( ) 37. A landscape architect plans buildings.

( ) 38. A stationary engineer remains on the job and supervises the construction of buildings.

( ) 39. Some of the oldest branches of engineering are aeronautical, air-conditioning, and radio.

( ) 40. From two to three years after graduation from high school are sufficient for training as a dentist.

( ) 41. A dentist needs special skill in getting along with people under difficult circumstances.

( ) 42. Excellent character and leadership are traits needed by anyone considering a career as a clergyman.

( ) 43. Embalmers and undertakers are professional workers.

( ) 44. Before deciding upon a career a person should study his own abilities and interests.

( ) 45. The business course in high school will give the best training for future education for the professions.

( ) 46. For success in medical professions a person should be cheerful and love his work.

( ) 47. If a young woman has unusual ability in mathematics and science, she may succeed in engineering.

( ) 48. Physicians, surgeons, and dentists do not need to study physiology and anatomy.

( ) 49. Dental nursing and school nursing are specialized branches of nursing.

( ) 50. The modern school employs a number of special teachers.

TEST

PART II

Directions: All omitted words or phrases appear in the column at the left of the page. Put the number of the blank in the correct parentheses at the left.

A.

( ) twenty-five per cent
( ) high
( ) acting
( ) fifty per cent
( ) low
( ) members
( ) standards
( ) nursing
( ) law
( ) engineering

About ___1___ of those who take bar examinations actually pass. This shows that an attempt has been made to keep the ___2___ of the profession of ___3___ as ___4___ as possible.

Very few people can really use ___5___ as a way of making a living.

B.

( ) junior colleges
( ) professional
( ) law
( ) architecture
( ) practical
( ) science
( ) semi-professional

___1___ was one of the earliest professions. The ___2___ are giving ___3___ training in engineering because there is more room for ___4___ engineers than trained ___5___

( ) poor
( ) graduates
( ) high schools

of a four year college.

C.

( ) strong body
( ) imagination
( ) making money
( ) social
( ) cheerful
( ) clerical
( ) selfishness
( ) love for work
( ) semi-professional
( ) poverty

Club sponsors and recreational directors are __1__ workers. An aviator is a __2__ worker. __3__ is a professional standard which should extend to all fields of work. A physician must be a __4__ person and he must have a __5__.

D.

( ) social
( ) case workers
( ) architects
( ) well-being
( ) ability
( ) honesty
( ) librarians
( ) bad
( ) actresses
( ) reading

__1__ workers are concerned with the __2__ of people. __3__ belong in this group of professional workers. __4__ must know a great deal about mathematics. __5__ is an important professional standard.

E.

( ) electrical
( ) civil
( ) stationary
( ) mining
( ) chemical
( ) mechanical
( ) sanitary
( ) metallurgical
( ) radio
( ) aeronautical

A __1__ engineer makes surveys and maps of land and water; the __2__ engineer locates and tests mineral deposits; and a __3__ engineer has to do with the installation of water works and sewage disposal systems.

The __4__ engineer is not classified as a profes- worker because college education is not required of him. Part of the work of a __5__ engineer is the invention and designing of tools.

F.

( ) journalists
( ) writing skill
( ) chemists
( ) strength
( ) free-lance
( ) answer
( ) teachers
( ) acting
( ) character
( ) opportunity

__1__ deal chiefly with people; __2__ deal with science.

Writers who work on their own time are __3.__. Those who work on a newspaper staff are __4__; a special type of __5__ is required of them.

G.

( ) service
( ) private nursing
( ) illness
( ) good health
( ) hospital
( ) patience
( ) store
( ) specialized
( ) money-making
( ) reports

Nursing offers a worker unusually fine opportunities for __1__. A nurse must have __2__ with people who are ill. After graduation she may continue work in a __3__ or go into __4__. Many nurses enter some __5__ branch of the work.

H.

( ) seven percent
( ) manual
( ) technical
( ) census
( ) semi-professional
( ) college
( ) professional
( ) unemployment
( ) ten percent
( ) high school

A __1__ worker is one whose work requires __2__ training equal to __3__ graduation. The __4__ reports show that less than __5__ of all workers are in this group.

I.

( ) seven
( ) science
( ) mathematics
( ) twelve
( ) literature
( ) electrician
( ) specialist
( ) pharmacist
( ) recreational leader
( ) artist

The training of a physician requires at least __1__ years after high school. Additional training is required of the __2__. Physicians and dentists must have a wide knowledge of __3__.

The period of training for a __4__ is shorter than for other occupations in the field of medicine.

A __5__ is a social worker.

J.

( ) drawing
( ) English
( ) mathematics
( ) waiting
( ) preparation
( ) decision
( ) women
( ) foreign languages
( ) natural aptitudes
( ) successes

A student who finds __1__ difficult for him should avoid engineering.

Librarians need to be good students of __2__.

To become a professional worker requires a long period of __3__ as well as certain __4__.

Very few __5__ work in engineering.

On the next two pages are four pictures showing scenes in the classroom in which the units were taught. The first two portray two different groups taking part in a panel discussion. (See optional activity 2 in the unit on professional workers.) The next picture shows pupils looking at the index cards describing optional activities, and the last one gives a view of two girls using some reference material.

FIRE

FIRE

CHAPTER IV.

AN EVALUATION OF THE UNITS

Results of objective testing.-- The results of objective testing on both units were satisfactory. The mean on the pre-test for Unit I was 59.75 with a standard deviation of 10. On the final test for the same unit the mean was 78.81 and the standard deviation was 10.04.

The mean score on the pre-test on Unit II was 64.84 and the standard deviation, 11.12. On the final test the mean score was 78.88, and the standard deviation, 9.12.[1/]

Knowing the pupil's actual growth is not sufficient; it is well to know his relative growth. In educational planning it is helpful to know how a pupil's actual growth compares with the growth made by others in the group and with the average growth of the class.

Using the calculated means and standard deviations, relative growth scales were constructed. Group I represents pupils of superior achievement; Group II, those who are decidedly above the average of the group; Group III, those whose growth is

1/ See Appendix B for computations.

average; Group IV, those whose growth is inferior. Figures 1 to 6 below show the actual distributions of pupil growth for the tests and points gained.

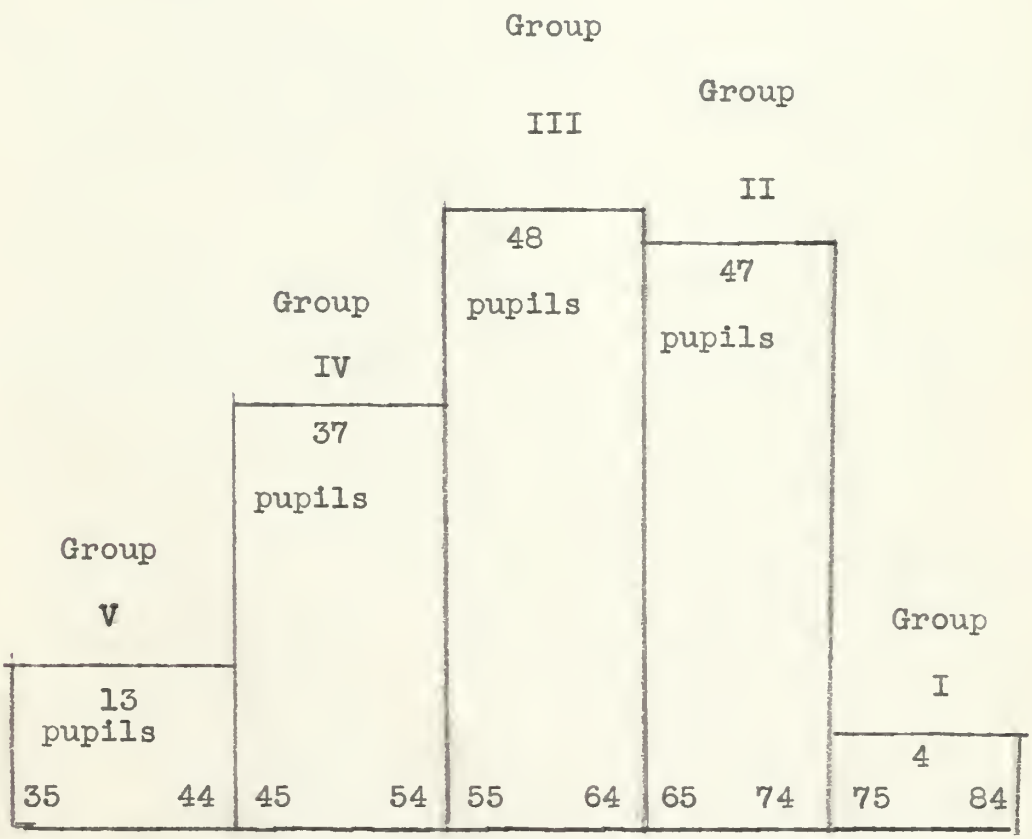

Figure 1. Relative Growth Scale--Pre-test, Unit I.

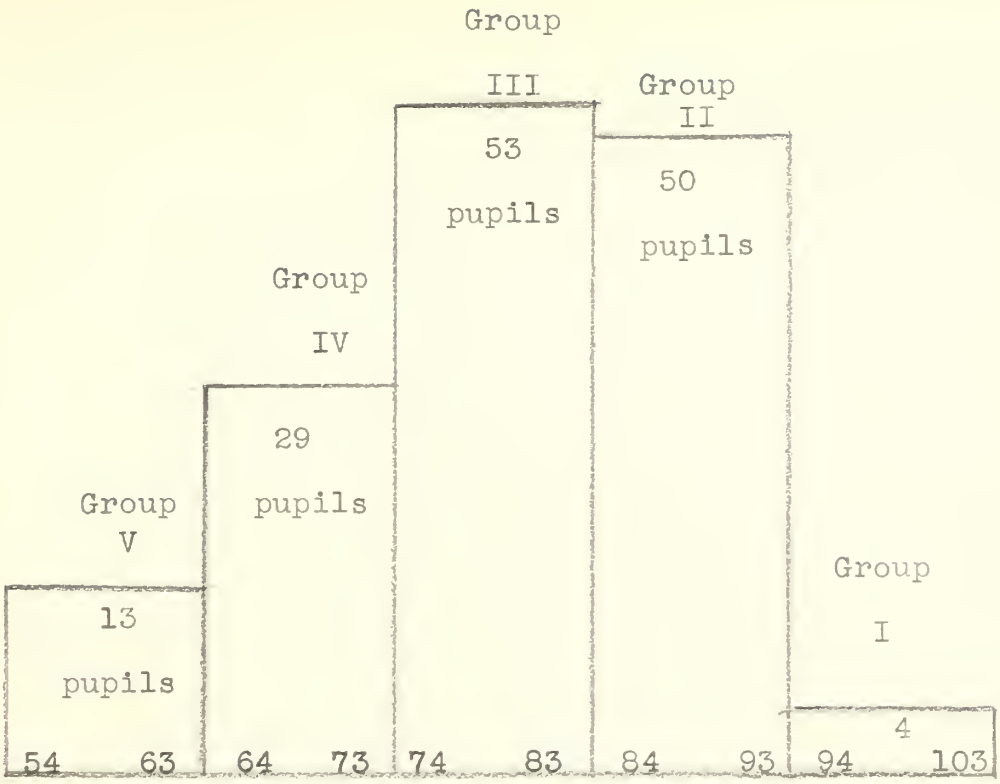

Figure 2. Relative Growth Scale--Final Test, Unit I.

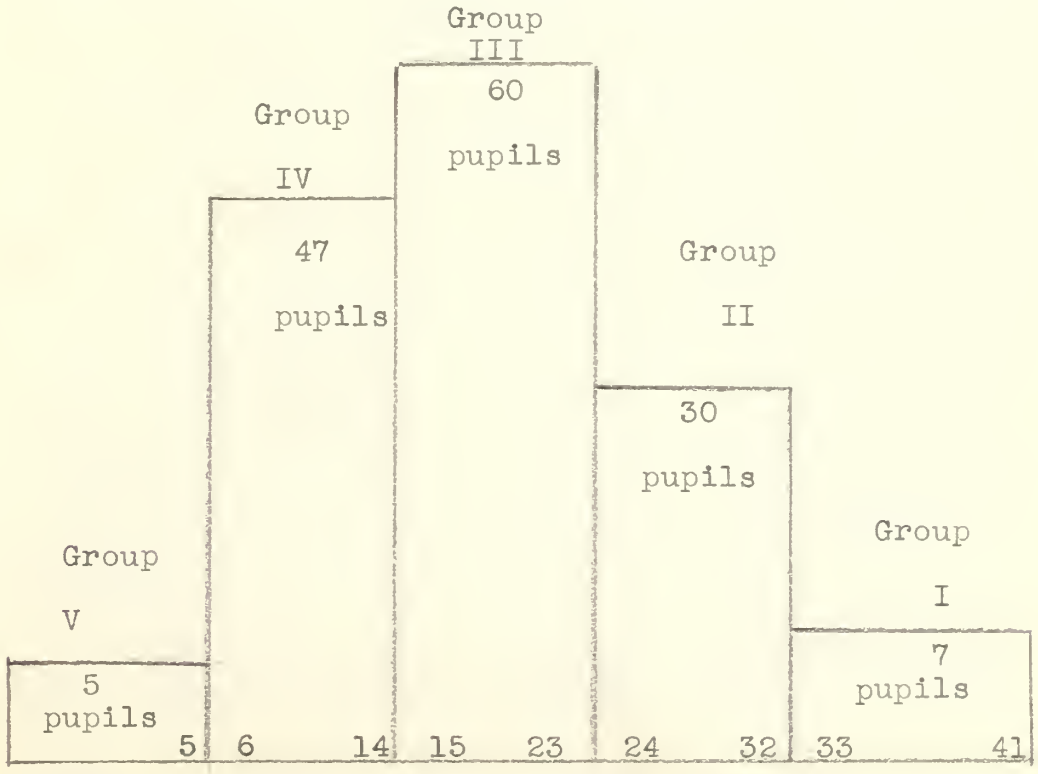

Figure 3. Relative Growth Scale--Points Gained, Unit I.

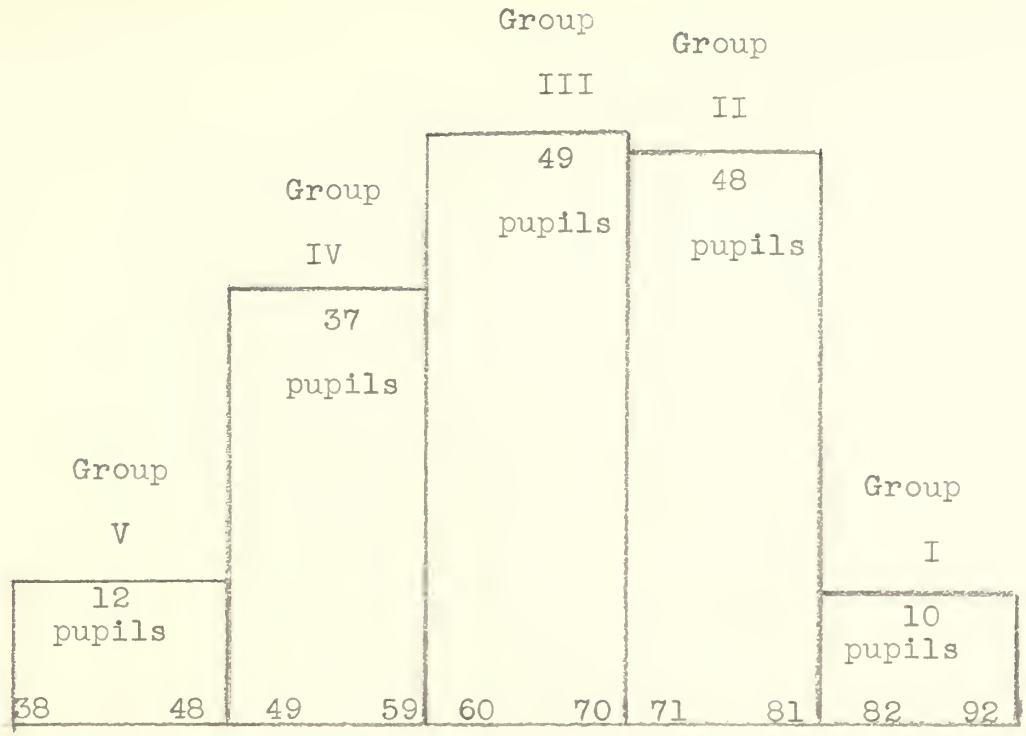

Figure 4. Relative Growth Scale--Pre-test, Unit II.

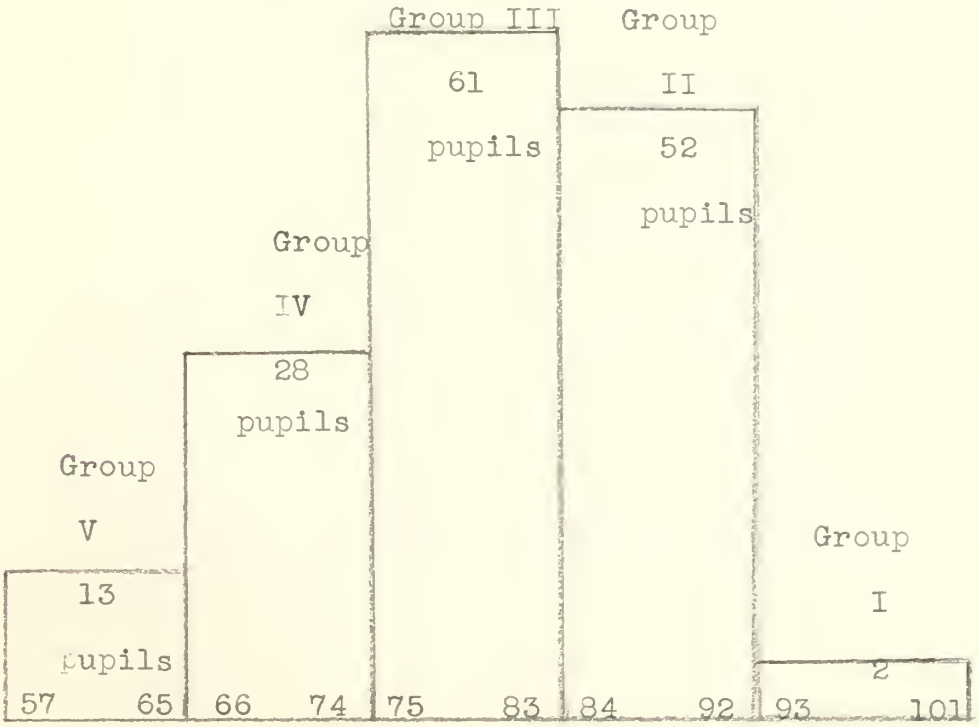

Figure 5. Relative Growth Scale--Final Test, Unit II.

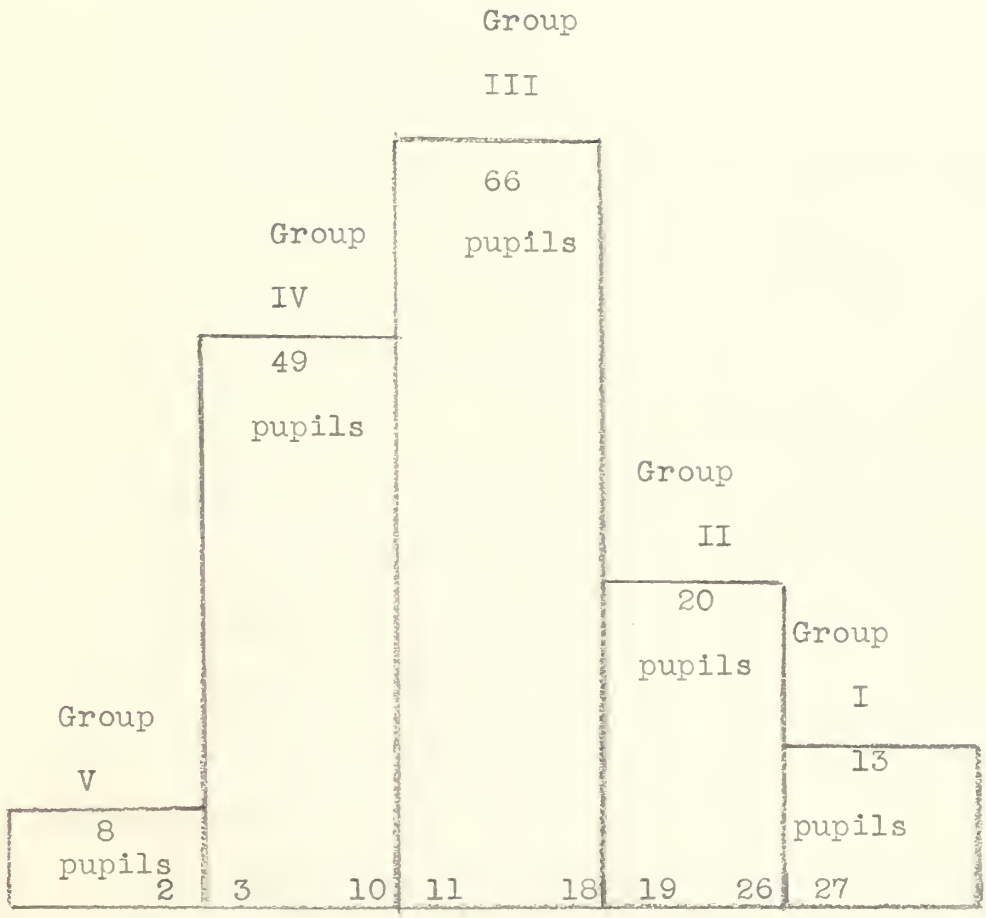

Figure 6. Relative Growth Scale--Points Gained, Unit II.

Pupil-reactions to the units.-- At the conclusion of the second unit for purposes of additional evaluation of the method, the pupils were asked to give candid and, if desired, anonymous answers to the following questions:

1. What did you like best about the way we studied occupations this year?
2. Was there anything you did not like about the way the work was done?
3. What is your opinion of the optional related activities?
4. What activities did you find most interesting?
5. What activities did you find least interesting?
6. Feel free to make additional comments if you wish to.

No attempt has been made to tabulate the answers, but a few generalizations may be made as a result of them. It is the writer's opinion that eighth-grade pupils are a little young to evaluate a method, but there did seem to be considerable agreement among them as to what they liked and did not like about it.

Outstanding was the feeling of pleasure at being able to plan their activities so that no two pupils had to do the same thing at the same time if they did

not want to. Several expressed their appreciation of not having to sit and wait while some of the slower boys and girls caught up with them. Using many books and pamphlets instead of one book was considered by many as the thing they liked best. "The tests were fun," was a comment made by a fairly large number.

Three things were mentioned as being undesirable, and these occurred frequently on the returned questionnaires. The first of these was to the effect that the time allowance was too short. This seemed to be felt by the better students who would naturally want to do more of the optional activities than the time limitation permitted. The second criticism was aimed at Part II of each test. Some complained that they were "too hard". An analysis of this showed that, in general, the complaint came from the slower pupils. The third general criticism was that the study guides were too long. These eighth-graders having been brought up on the traditional day by day assignment were possibly overwhelmed by the length of the guides. In teaching other units greater emphasis will have to be placed on the fact that it is not necessary that <u>all</u> pupils do <u>all</u> of the activities provided.

Those who attempted the optional activities

(approximately 35 per cent) felt that they were more interesting than the activities on the study guides. Many who did no optional activities reported that they enjoyed hearing about what the others had done.

In Unit I optional activities not attempted by anyone were 3, 9, and 11; and no one chose to do 7, 11, 15, 16, or 17 in Unit II. The panel discussion suggested in Unit II was an outstanding success. Pupil participation in the discussion following the talks given by panel members was most gratifying. The children liked this activity and asked if they might do something similar on a later unit.

Knowing that they would be given a chance to explain what they had done on the optional activities and planning with a pupil chairman as to how and when the work would be presented was an incentive toward making worth-while contributions.

Conclusion.--Because the work was individualized, the teacher had an opportunity to become far better acquainted with the pupils, and therefore could guide them more effectively than in the traditional classroom procedure.

The experience gained from the planning and teaching of these units gave sufficient assurance that, despite numerous handicaps, unit organization is a practical and excellent method of teaching.

APPENDIXES

APPENDIX A

Keys to Mastery Tests

Test I -- Part I

1.	+	21.	+	41.	+
2.	0	22.	0	42.	0
3.	0	23.	0	43.	0
4.	0	24.	0	44.	+
5.	+	25.	0	45.	0
6.	+	26.	+	46.	0
7.	+	27.	+	47.	+
8.	0	28.	0	48.	0
9.	+	29.	0	49.	+
10.	0	30.	0	50.	0
11.	+	31.	0		
12.	0	32.	+		
13.	+	33.	+		
14.	+	34.	+		
15.	0	35.	+		
16.	+	36.	+		
17.	+	37.	+		
18.	0	38.	0		
19.	+	39.	0		
20.	0	40.	+		

Test I -- Part II.

A.

1. limited
2. 83 per cent
3. ten
4. 74 per cent
5. 42 per cent

B.

1. field of work
2. intelligence
3. happiness
4. dictate
5. young people

C.

1. talks with workers
2. text book
3. up-to-date
4. vocations
5. 371.42

D.

1. United States Census
2. ten
3. 1950
4. sixteenth
5. United States Government

E.

1. Dictionary of Occupational Titles
2. Bureau of Employment Security
3. thousands
4. United States Census
5. eleven

F.

1. opportunities
2. school
3. outside
4. interests
5. wise

G.

1. skill
2. unskilled
3. professional
4. semi-skilled
5. four

Test I -- Part II (cont.)

H.

1. abilities
2. match
3. occupation
4. mistaken
5. training

I.

1. trend
2. development
3. decline
4. changes
5. mass production

J.

1. pamphlet
2. Vocational Trends
3. required tasks
4. change
5. three hundred

Test II -- Part I

1.	+	21.	0	41.	+
2.	+	22.	0	42.	+
3.	0	23.	+	43.	0
4.	+	24.	+	44.	+
5.	0	25.	+	45.	0
6.	+	26.	0	46.	+
7.	0	27.	0	47.	+
8.	+	28.	0	48.	0
9.	0	29.	+	49.	+
10.	0	30.	0	50.	0
11.	+	31.	+		
12.	0	32.	+		
13.	0	33.	0		
14.	+	34.	+		
15.	+	35.	+		
16.	0	36.	0		
17.	+	37.	0		
18.	0	38.	0		
19.	+	39.	0		
20.	+	40.	0		

Test II -- Part II.

A.

1. fifty per cent
2. standards
3. law
4. high
5. acting

B.

1. law
2. junior colleges
3. practical
4. semi-professional
5. graduates

C.

1. social
2. semi-professional
3. love for work
4. cheerful
5. strong body

D.

1. social
2. well-being
3. case workers
4. architects
5. honesty

E.

1. civil
2. mining
3. sanitary
4. stationary
5. mechanical

F.

1. teachers
2. chemists
3. free-lances
4. journalists
5. writing skill

G.

1. service
2. patience
3. hospital
4. private nursing
5. specialized

H.

1. professional
2. technical
3. college
4. census
5. seven per cent

I.

1. seven
2. specialist
3. science
4. pharmacist
5. recreational leader

J.

1. mathematics
2. English
3. preparation
4. natural aptitudes
5. women

APPENDIX B

Computations of Means and Standard Deviations

Pre-test on Unit I.

82 - 31 = 51 + 1 = 52

52 ÷ 12 = 5 = Class Interval

		f	d	fd		fd^2
	80 - 84	2	+ 4	+ 8		32
	75 - 79	2	+ 3	+ 6		18
	70 - 74	17	+ 2	+ 34		68
	65 - 69	30	+ 1	+ 30		30
Est. M 62.5	60 - 64	34	0	0	+ 78	
	55 - 59	14	-1	-14		14
	50 - 54	23	-2	-46		92
	45 - 49	14	-3	-42		126
	40 - 44	8	-4	-32		128
	35 - 39	3	-5	-15		75
	30 - 34	2	-6	-12	-161	72
		149				655

-161 -83 ÷ 149 = -.55 62.50

+ 78 .55 x 5 = -2.75 (correction) 2.75

-83 59.75 True Mean

.55 x -.55 = .3025

655 ÷ 149 = 4.39 $\sqrt{4.0875} = 2$

4.39 - .3025 = 4.0875 2 x 5 = 10 = Standard Deviation

Final Test on Unit I.

97 - 52 = 45 + 1 = 46

46 ÷ 12 = 4 = Class Interval

		f	d	fd		fd^2
	94 - 97	4	+4	+16		64
	90 - 93	14	+3	+42		126
	86 - 89	19	+2	+38		76
	82 - 85	25	+1	+ 25		25
					+ 121	
Est. M 80	78 - 81	30	0			
	74 - 77	15	-1	-15		15
	70 - 73	16	-2	-32		64
	66 - 69	8	-3	-24		72
	62 - 65	7	-4	-28		112
	58 - 61	3	-5	-15		75
	54 - 57	5	-6	-30		180
	50 - 53	3	-7	-21		147
					-165	
		149				956

-165 + 121 = -44

-44 ÷ 149 = -.2953

.2953 x 4 = 1.1812 (correction)

80. - 1.1812 = 78.8188 True Mean

-.2953 x -.2953 = .0872

956 ÷ 149 = 6.4161

6.4161 - .0872 = 6.3289

$\sqrt{6.3289} = 2.51$

2.51 x 4 = 10.04 Standard Deviation

Points Gained on Unit I.

Range 1 - 52

52 ÷ 12 = Class Interval of 5

		f	d	fd		fd^2
	51 - 55	1	+ 7	+ 7		49
	46 - 50	3	+ 6	+ 18		108
	41 - 45	0	+ 5	0		0
	36 - 40	3	+ 4	+ 12		48
	31 - 35	8	+ 3	+ 24		72
	26 - 30	14	+ 2	+ 28		56
	21 - 25	28	+ 1	+ 28	+ 117	28
Est. M. 18	16 - 20	38	0			
	11 - 15	34	-1	-34		34
	6 - 10	15	-2	-30		60
	1 - 5	5	-3	-15	-79	45
		149				500

+ 117 — 38 ÷ 149 = .2550 — 18

-79 — .2550 x 5 = 1. 2750 (correction) — ± 1.27

+ 38 — 19.27 - True Mean

.2550 x .2550 = .0650

500 ÷ 149 = 3.3557

3.3557 - .0650 = 3.2907

$\sqrt{3.2907} = 1.81$

1.81 x 5 = 9.05 Standard Deviation

Pre-test on Unit II.

87 - 40 = 47 + 1 = 48

48 ÷ 12 = Class interval of 4

		f	d	fd		fd^2
	85 - 88	5	+ 5	+ 25		125
	81 - 84	8	+ 4	+ 32		128
	77 - 80	13	+ 3	+ 39		117
	73 - 76	18	+ 2	+ 36		72
	69 - 72	23	+ 1	+ 23		23
					+ 155	
Est. M 66	65 - 68	21	0			
	61 - 64	13	-1	-13		13
	57 - 60	20	-2	-40		80
	53 - 56	13	-3	-39		117
	49 - 52	10	-4	-40		160
	45 - 48	5	-5	-25		125
	41 - 44	6	-6	-36		216
	37 - 40	1	-7	-7		49
					-200	
		156				1225

-200 -45 ÷ 156 = -.2884 66

+155 -.2884 x 4 = -1.1536 (correction) -1.1536

-45 64.8464

True Mean

-.2884 x -.2884 = .0831

1225 ÷ 156 = 7.8525

7.8525 - .0831 = 7.7694

$\sqrt{7.7694} = 2.78$

2.78 x 4 = 11.12 Standard Deviation

Final Test on Unit II.

94 - 46 = 48 + 1 = 49;

49 + 12 = 4 = Class Interval

		f	d	fd		fd^2
	94 - 97	1	+ 4	+ 4		16
	90 - 93	10	+ 3	+ 30		90
	86 - 89	30	+ 2	+ 60		120
	82 - 85	30	+ 1	+ 30		30
					+ 124	
Est. M. 79.5	78 - 81	26	0			
	74 - 77	23	-1	-23		23
	70 - 73	15	-2	-30		60
	66 - 69	8	-3	-24		72
	62 - 65	3	-4	-12		48
	58 - 61	6	-5	-30		150
	54 - 57	1	-6	-6		36
	50 - 53	1	-7	-7		49
	46 - 49	2	-8	-16		128
					-148	
		156				822

-148 -24 + 156 = -.1532 79.5

+124 -.1532 x 4 = .6128 (correction) .6128

-24 78.8872 True Mean

-.1532 x -.1532 = .0234

822 + 156 = 5.2692

5.2692 - .0234 = 5.2458

$\sqrt{5.2458} = 2.28$

2.28 x 4 = 9.12 Standard Deviation

Points Gained on Unit II.

Range 1 - 40

40 ÷ 12 = 3+ = Class Interval

	f	d	fd		fd^2
40 - 43	1	+9	+ 9		81
37 - 39	1	+ 8	+ 8		64
34 - 36	0	+7	+ 0		0
31 - 33	1	+6	+6		36
28 - 30	8	+5	+40		200
25 - 27	5	+4	+ 20		80
22 - 24	7	+3	+ 21		63
19 - 21	10	+ 2	+ 20		40
16 - 18	20	+1	+ 20		20
				+ 144	
Est. M. 14 — 13 - 15	28	0	0		0
10 - 12	24	-1	-24		24
7 - 9	16	-2	-32		64
4 - 6	25	-3	-75		225
1 - 3	10	-4	-40		160
				-171	
	156				1057

-171 -27 ÷ 156 = -.1730 14.

+144 -.1730 x 3 = .5190 (correction) .5190

-27 13.4810 True Mean

-.1730 x -.1730 = .0299

1057 ÷ 156 = 6.7756

6.7756 - .0299 = 6.7457

$\sqrt{6.7457} = 2.59$

2.59 x 3 = 7.77 Standard Deviation

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